Perceptions on the Utilization of Self-Learning Modules (SLMs) and their Academic Performance Ensuring Educational Continuity in Times of Disasters

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ABSTRACT

This study assessed students' perceptions of Science 10 Self-Learning Modules (SLMs) and their academic performance as a means of ensuring educational continuity during disasters. Utilizing a descriptive-correlational research design, the study involved 60 Grade 10 students from Lorenzo Latawan National High School, selected through purposive sampling for the 2025-2026 school year. Data were collected via survey questionnaires using the Likert scale for scoring, focusing on five key indicators: access and availability, clarity and quality of content, self-directed learning, learning continuity, and challenges faced. Results indicated that SLM utilization was perceived as "Moderately Implemented" across most areas, with Access and Availability receiving the highest mean score (4.26), Clarity and Content (4.25) Challenges Faced receiving the lowest (3.76), interpreted as "Slightly Implemented". Academic performance showed that the majority of students achieved satisfactory (43.33%) or Very Satisfactory (28.33%) grades, confirming basic continuity. The inferential analysis using Spearman's Rank Correlation Coefficient (ρ) revealed no statistically significant relationship between students' perceptions of SLM utilization and their academic performance (all $\rho>0.05$). The study concludes that while SLMs meet basic standards of equality, their perceived quality does not serve as a reliable predictor of student success. Recommendations focus on shifting interventions from module revision to comprehensive home-based support and the explicit teaching of Self-Regulated Learning (SRL), as these contextual factors appear to be true drivers of academic success.

Keyword: Self-Learning Modules, Educational Continuity, Academic Performance, Disasters, Self-Regulated Learning

INTRODUCTION

In the Philippines, learning is frequently derailed by factors outside the classroom-typhoons, earthquakes, volcanic eruptions and floods. Such disasters ruin infrastructure and disrupt the flow of learning, forcing students and teachers to negotiate uncertainty with limited resources. The classroom for many Filipino learners, especially those in public schools, isn't just a site of learning- it's a haven of hope. When disaster strikes, keeping that spark alive through education is a national emergency.

To solve the aforementioned issue, the Department of Education (DepEd) launched Self-Learning Modules (SLMs) under its Basic Education Learning Continuity Plan (DepEd Order No. 12, s. 2020). The modules were developed to enable students to continue studying independently, even without access to teachers or technology. Science 10, which explores more difficult materials in biology, chemistry, physics, and earth science, is particularly challenging under this scenario. It requires understanding, as well as critical thinking and experimentation – things that can be hard to train in isolation.

Globally, the shift to remote and modular learning had mixed outcomes. Adedoyin and Soykan (2020) noted that while online and self-paced learning offered flexibility during the COVID-19 pandemic, it also exposed gaps in digital access, instructional design, and learner autonomy. In the U.S., Allen and Seaman (2013) emphasized the

importance of structured support systems in distance education, ensuring students' success. These findings reflect local experiences where students often struggle with motivation, comprehension, and access to materials during disasters.

In the Philippine context, studies have begun to explore the effectiveness of SLMs. Alicabo and Cacharo (2025) found that while learners appreciated the clarity of Science SLMs, challenges remained in terms of accessibility and self-directed learning, especially during calamities. Dulay and Manuel (2021) highlighted the emotional and logistical burdens faced by teachers in Pangasinan during emergency remote teaching, underscoring the need for unified learning materials and better training. Alinsunurin et al. (2021) further emphasized that SLMs must be complemented by teacher support and community engagement to be truly effective.

At the local level, schools in Bukidnon and other disaster-prone areas have reported varying degrees of success with Self-Learning Modules (SLMs) implementation. Alon, Reyes, and Cruz (2022) observed that while SLMs helped sustain academic performance among Grade III pupils, their impact was limited by household conditions and parental involvement. Meanwhile, Alonzo, Santos, and Ramos (2021) stressed the importance of student engagement and feedback in refining module content and delivery.

By assessing the perceptions on the utilization of Science 10 SLMs and the academic performance of the students as tools for educational continuity during disasters, this research aims to provide evidence-based recommendations for school heads, department of education officials, and policy-makers. It will not just explore how these modules support student learning in times of crisis, focusing on accessibility, content clarity, learner autonomy, and academic outcomes but also contribute to a more resilient and inclusive education system—one that can withstand the storms and still deliver learning to Lorenzo Latawan National High School students.

Statement of the Problem

This research was intended to assess the students' level of perceptions on the utilization of Science 10 SLMs and their academic performance in ensuring educational continuity in times of disasters, specifically at Lorenzo Latawan National High School, Paquibato District, Division of Davao City. This research focused on several key areas: access and availability of the modules, clarity and quality of content, promotion of self-directed learning and independence, overall effectiveness in maintaining learning continuity, and the challenges faced by the students.

Specifically, it aimed to answer the following questions:

1. What is the student's level of perception regarding SLM utilization in terms of Access and Availability, Clarity and Quality of Content, Self-Learning and Independence, Ensuring Learning Continuity, and Challenges Faced?

2. Is there a significant relationship between the students' perceptions of Self-Learning Module (SLM) utilization in terms of Access and Availability, Clarity and Quality of Content, Self-Learning and Independence, Ensuring Learning Continuity, and Challenges Faced and their academic performance?

Research Hypothesis

The following hypothesis was tested at $\alpha=0.05$ level of significance.

H_0: There is no significant relationship between the students' perceptions of Self-Learning Module (SLM) utilization in terms of Access and Availability, Clarity and Quality of Content, Self-Learning and Independence, Ensuring Learning Continuity, and Challenges Faced and their academic performance.

METHODOLOGY

Research Design

The research design employed in this study is descriptive-correlational. This choice was strategically made to effectively address the two primary research questions posed in the Statement of the Problem. The descriptive

component of the design serves to accurately and systematically describe the characteristics of the population and the phenomenon under investigation (Creswell & Creswell, 2018). This component was essential for addressing Research Question 1: What is the students' level of perception regarding SLM utilization in terms of Access and Availability, Clarity and Quality of Content, Self-Learning and Independence, Ensuring Learning Continuity, and Challenges Faced? Descriptive statistics, like the Mean was used to quantify the central tendency and dispersion of student perceptions across the five indicators. By establishing the current state of student perceptions and academic outcomes, the descriptive phase laid the foundation for the subsequent inferential analysis. It provided the baseline data needed to confirm the general success of the SLMs in ensuring educational continuity before testing the relationship hypothesis (Polit & Beck, 2021).

The correlational component used inferential statistics to test the hypothesized relationship (R2) focuses on determining the nature, strength, and direction of the relationships between two or more variables without manipulation (Kerlinger & Lee, 2000). This component was vital for addressing Research Question 2: Is there a statistically significant relationship between the students' perceptions of SLM utilization and their Academic Performance? Inferential statistics were utilized to test the null hypothesis and determine the nature of the relationship between the variables, addressing the second question. Spearman's Rank Correlation Coefficient (ρ), a non-parametric test was chosen as the data for the dependent variable (academic performance) were treated as ordinal data. The test measures the strength and direction of the monotonic relationship between the mean scores of the five perception indicators (independent variable) and the ranked academic grades (dependent variable).

Research Environment

The locale of the study was specifically a public secondary educational institution, Lorenzo Latawan National High School, situated within Davao City, Philippines. This location was strategically selected because it serves a large cohort of Grade 10 students who were actively using the Science 10 Self-Learning Modules (SLMs) as their primary mode of instruction during the period of disasters. The selection of this specific locale ensures that the findings regarding the utilization of Science 10 Self-Learning Modules (SLMs) and resulting academic outcomes are grounded in the actual experience of students navigating disaster-responsive education.

Respondent

The research respondents were the ones who are involved in the study. The study's respondents were the Grade 10 students of Lorenzo Latawan National High School. The study allowed the respondents to withdraw from participation at any time if they felt threatened, physically uncomfortable, emotionally disturbed, or any other similar feelings or conditions. The respondents in this study were the 60 Grade 10 students from Lorenzo Latawan National High School, Paquibato District, Division of Davao City, for the School Year 2025-2026. Purposive sampling was employed where the researcher intentionally selects the respondents. Purposive sampling is effective when researchers need knowledgeable respondents who can provide accurate and reliable data about a particular phenomenon (Tongco, 2007).

Instrument

The research instrument for this study, "Perceptions on the Utilization of Science 10 Self-Learning Modules (SLMs) and their academic performance in ensuring educational continuity in times of disasters," was adapted from various established frameworks: DepEd Order No. 12, s. 2020. (2020), Garrison, D. R., & Akyol, Z. (2015), Vaughan, N. D., Parchoma, G., & Garrison, D. R. (2013), and Laksana, T., & Santoso, P. B. (2021).

Scoring Procedure

Table 1. Shows the Scoring procedure of the Study

Scale	Qualitative Description	Qualitative Standard

4.21-5.00	Fully implemented	Always implemented
3.41-4.20	Moderately implemented	Implemented most of the time
2.61-3.40	Slightly implemented	Implemented sometimes
1.81-2.60	Less implemented	Implemented rarely
1.00-1.80	Not implemented	Not at all implemented

The study used the Likert Scale for scoring. It is numbered 1-5, and each number has a corresponding qualifying description. Perceptions on the Utilization of Science 10 Self-Learning Modules (SLMs) and their Academic Performance in Ensuring Educational Continuity in times of Disasters," 5 means fully implemented, 4 is moderately implemented, 3 is slightly implemented, 2 means less implemented, and 1 means not implemented.

Procedure

The data was gathered from the enrolled 60 Grade 10 students of Lorenzo Latawan National High School for the School Year 2025-2026 using survey questionnaires. Written permission from the school head was secured through the recommendation from the researcher's professor in MSTB RES601 subject of the Institute of Advanced Studies of Davao del Norte State College.

The procedures needed for this academic endeavor were followed by the researcher which involved the following:

Seeking permission to conduct the study. A notification to commence the study will be secured from the Institute of Advanced Studies of Davao del Norte State College. This document will be obtained after the approval of the panel of experts. Subsequently, the pertinent documents will be submitted to the Office of the School Head to obtain the School Principal's permit to conduct the study.

General Orientation and Seeking of Consent from Research Respondents. A letter of intent was given to the school head, and then, the respondents were oriented on the research and given the informed consent forms.

Conduct of the Study. The study was introduced to the respondents, and the research tool and its purpose were explained to them. After that, the respondents completed the survey questionnaires and took the test questionnaire.

Checking, Collating and Processing of Data. Finally, upon retrieving the questionnaires, all responses and their scores will be encoded in a spreadsheet by the researcher and submitted to the statistician for statistical analysis. The results will be analyzed and interpreted according to the research objectives. Conclusions will be drawn, and recommendations were formulated based on the study's findings.

Data Analysis

The responses to the items in the questionnaire–checklist was scored and tabulated. In analyzing and interpreting the data gathered, the following treatments were employed:

Problem 1. The mean was used to determine the level of central tendency for each of the five perception indicators: Access and Availability, Clarity and Quality of Content, Self-Learning and Independence, Ensuring Learning Continuity, and Challenges Faced. The mean score for each indicator was then interpreted using the five-point Likert Scale (5 means fully implemented, 4 is moderately implemented, 3 is slightly implemented, 2 means less implemented, and 1 means not implemented). Descriptive statistics was implemented like Standard Deviation (SD) for summarizing performance and the level of student's perceptions on SLMs.

Problem 2. Spearman's Rank Correlation Coefficient (ρ), a non-parametric test was used to test the relationship between the five perception means and the ranked academic performance at the 0.05 significance level.

Ethical Considerations

The researcher ensured the respondents' protection and anonymity and obtained their consent, safeguarding the ethical standards of conducting research.

Respect for Person. It guarantees that all respondents have the right to privacy to protect their autonomy, self-determination, and well-being. It underscored the importance of an individual's right to privacy, ensuring their personal information remains confidential.

Voluntary Participation. The researcher gave all the respondents the freedom to choose whether or not to participate in this endeavor without any effect or penalty. The researcher upholds the participants' right to willingly take part in the study, ensuring that their involvement is completely voluntary and free from any form of pressure or compulsion.

Informed Consent Process. Respondents are given both an informed consent form and an assent form, which thoroughly explain the details of the study, including its benefits, confidentiality measures, procedures, and timeline. They are informed of their right to withdraw from the study at any time without consequence. These forms are signed by both the researcher and the participants. Prior to data collection, the researcher secured all required approvals from the college's research ethics committee, the graduate school dean, and the respective school principals or heads and teachers.

Privacy and Confidentiality. Respondents' confidentiality will be safeguarded. Respondents' names remain undisclosed to ensure anonymity and privacy. The researcher informed the respondents about this aspect during their orientation. The researcher collected, compiled, tabulated, and interpreted the data confidentially as the foundation of the study. The researcher maintained strict confidentiality throughout the entire duration of the study. The researcher strictly adheres to the Data Privacy Law, ensuring utmost confidentiality.

Recruitment. This study focuses on Grade 10 students in Lorenzo Latawan National High School, Division of Davao City. The researcher will provide details about respondent distribution, data collection methods, questionnaire management, and participant involvement.

Risks. The study poses no significant risks to respondents' physical, physiological, or socioeconomic well-being. Respondents will receive briefing and debriefing sessions from the researcher through their advisor. Whether or not they participate in the study will not directly/indirectly affect them.

Benefits. This study's findings benefit the schools in Division of Davao City. Respondents will receive simple tokens for their involvement.

Plagiarism. There was no evidence to disprove the uniqueness of this corpus of research, nor was there any indication that the author had plagiarized and passed off someone else's work as his own. The study even examined plagiarism detected by programs like Turnitin and Grammarly.

Fabrication. The paper asserts that purposeful misreading, intentional inclusion of false assumptions, and intentional use of inaccurate data have not altered the evidence presented here or its implications.

Falsification. The researchers did not misread work or manipulate data to fit personal biases. No change or exaggeration has occurred.

Conflict of Interest. The study is devoid of any conflicts of interest. No elements could compromise professional judgment due to secondary interests like monetary gain or academic rewards.

Deceit. As a result, the study finds no connection between respondents' gains and informational errors.

Permission from Organization/Location. The thesis advisor and graduate school dean co-signed a letter to request formal consent from the hosting institution. The university's Ethics Review Committee granted us ethical approval. We will submit the research material to the relevant agency. The researcher seeks permission from the

school principal to conduct the study. Next, the researcher will ask the selected Grade 10 students for permission and guidance.

Authorship. The researcher, a Bachelor of Secondary Education—Biological Science graduate underwent revisions based on the advisor's recommendations and adhered to the college's ethical guidelines. It also followed the processes set by Davao del Norte State College's Institute of Advanced Studies before, during, and after the study's conduct.

RESULTS AND DISCUSSION

This chapter offers the presentation of the findings of the study, "Perceptions on the Utilization of Science 10 Self-Learning Modules (SLMs) and their Academic Performance in Ensuring Educational Continuity in times of Disasters." This assesses the students' level of perceptions on the utilization of Science 10 SLMs and their academic performance in ensuring educational continuity in times of disasters focused on several key areas: access and availability of the modules, clarity and quality of content, promotion of self-directed learning and independence, overall effectiveness in maintaining learning continuity, and the challenges faced by the students.

Level of Perceptions on SLM Utilization

Table 2. Level of perception regarding SLM utilization in terms of Access and Availability, Clarity and Quality of Content, Self-Learning and Independence, Ensuring Learning Continuity, and Challenges Faced

	Mean (M)	Standard Deviation (SD)	Descriptive Equivalent
Access and Availability	4.26	0.57	Moderately Implemented
Clarity and Quality of Content	4.25	0.66	Moderately Implemented
Self-Learning and Independence	4.15	0.61	Moderately Implemented
Ensuring Learning Continuity	4.18	0.60	Moderately Implemented
Challenges Faced	3.76	0.97	Slightly Implemented

Table 2 presents the mean scores and descriptive equivalents for the various indicators of SLM utilization. The data reveals that Access and Availability garnered the highest mean score (4.26), followed closely by Clarity and Quality of Content (4.25). Both were interpreted as "Moderately Implemented". Conversely, Challenges Faced received the lowest mean score of 3.76, described as "Slightly Implemented". The overall grand mean of 4.12 suggests that, in general, the utilization of SLMs is perceived as moderately implemented across all measured indicators. The findings indicate a positive perception of SLM utilization, particularly in terms of how the highest mean score was recorded for Access and Availability (4.26), indicating a "Moderately Implemented" status. This suggests that the logistical framework for module distribution is relatively robust. This aligns with the findings of Choi et al. (2020), who emphasized that the success of distance education is primarily predicated on the equitable distribution of learning materials. If learners cannot access the physical or digital modules, the instructional process fails before it begins.

Clarity and Quality of Content (4.25) and Learning Continuity (4.18) also scored high. According to UNESCO (2021), the modularity of learning allows for a self-paced environment that maintains academic momentum during periods where traditional classroom settings are unavailable. The clarity of the modules is crucial. Malipot (2020) noted that for SLMs to be effective, they must be self-standing, meaning they contain enough explanation and examples to compensate for the absence of a live instructor.

The score for Self-Learning and Independence (4.15) suggests that while modules are available, students are still transitioning toward becoming independent learners. Zimmerman (2002) identifies self-regulation as a key factor

in academic success within non-traditional settings. The moderate score here may indicate that students still require significant parental or teacher scaffolding to navigate the modules effectively, a common hurdle in modular distance learning (MDL).

The lowest mean was found in Challenges Faced (3.76). While categorized as "Slightly Implemented," this indicates that obstacles such as module fatigue, lack of immediate feedback, and home distractions remain present. Dargo and Abate (2021) argue that the implementation gap in modular learning often stems from a lack of two-way communication, which can lead to decreased student motivation over time.

The high means confirm the successful execution of the BE-LCP in providing high-quality and accessible resources. However, the significantly high SD for Challenges Faced highlights heterogeneity in the learning environment, suggesting that overcoming disasters is the most inconsistent aspect of the modular experience.

Academic Performance

Table 3. Frequency distribution of the students' academic performance in Science 10

Academic Performance	Descriptive Equivalent	Frequency	Relative Frequency
90-100	Outstanding	10	16.67%
85-89	Very Satisfactory	17	28.33%
80-84	Satisfactory	26	43.33%
75-79	Fairly Satisfactory	7	11.67%
<75	Did Not Meet the Expectations	0	0.00%
Total		60	100.00%

Table 3 presents the frequency distribution of the student's academic performance in Science 10. The combined 71.66% of the students achieved a rating of Satisfactory or Very Satisfactory, demonstrating that the SLM's were effective in maintaining a basic level of educational continuity.

Relationship between perceptions and academic performance

The inferential analysis using Spearman's Rho was conducted to test the hypothesis.

Table 4. Significant relationship between the students' perceptions of SLM utilization in terms of Access, Clarity, Independence, Continuity, and Challenges and their Academic Performance

SLM Indicator	Spearman's Rho (ρ)	p-value	Significance
Access and Availability	-0.201	0.123	Not significant
Clarity and Quality of Content	0.066	0.618	Not significant
Self-Learning and Independence	-0.144	0.272	Not significant
Ensuring Learning Continuity	-0.013	0.919	Not significant
Challenges Faced	0.051	0.697	Not significant

Table 4 presents the Spearman's Rho (ρ) correlation coefficients between the students' perceptions of SLM utilization and their academic performance.

As shown in Table 4, all p-values are significantly greater than the 0.05 significance level, thus the null hypothesis is accepted. The inferential analysis for Research Question 2 yielded results that necessitate the formal acceptance of the Null Hypothesis, asserting that there is no statistically significant relationship between students' perceptions of Science 10 SLM utilization and their academic performance. This statistical decision is rooted in the comparison of the computed p-values against the predetermined 0.05 level of significance (□=0.05). As the data reveals, all five perception indicators produced p-values substantially higher than the acceptable threshold: Access and Availability (p=0.123), Clarity and Content (p=0.618), Self-Learning and Independence (p=0.272), Ensuring Learning Continuity (p=0.919), and Challenges Faced (p=0.697). Consequently, the Spearman's Rank Correlation coefficients (rho), ranging from a weak negative correlation of -0.201 to a negligible positive correlation of 0.066, indicate a complete lack of a monotonic relationship between the variables. According to Pallant (2020), coefficients so close to zero demonstrate that the ranks of student perceptions do not correspond with the ranks of their academic grades in any predictable pattern.

The non-significant findings highlight a critical Perception-Performance Gap, suggesting that a student's favorable view of instructional materials is not a reliable predictor of their actual achievement. For instance, the indicator for Clarity and Content yielded a p-value of 0.618, implying that while students may find the modules easy to read or follow, this readability does not necessarily equate to the cognitive mastery of complex Science 10 competencies. This suggests that the SLM, as a passive instructional tool, is a necessary but insufficient condition for academic success. In a non-experimental, correlational design, the absence of a significant link often reveals that the independent variable (perception) does not exert a direct influence on the dependent variable (performance).

Furthermore, the overwhelming lack of significance underscores the dominance of external, confounding variables that likely dictate academic outcomes in a modular distance learning setting. Factors such as the home learning environment, level of parental support, and the student's intrinsic motivation appear to be the primary drivers of success, effectively overshadowing the perceived quality of the module itself. The high variability previously noted in the Challenges Faced indicator (SD=0.97) reinforces the idea that students' personal contexts are highly inconsistent and serve as the true mediators of performance. As Kerlinger and Lee (2000) argue, in correlational research, when the hypothesized relationship is not found, it often points to powerful extraneous factors that were not the primary focus of the measurement.

Finally, the highest p-value recorded—Ensuring Learning Continuity (p=0.919) - suggests a profound disconnect between the logistical success of the SLM program and its pedagogical impact. While the modules successfully maintained the process of education during a crisis, they did not inherently guarantee quality learning outcomes. For educational administrators, this implies that focusing solely on module distribution and technical clarity is insufficient for improving student grades. The study concludes that academic performance in Science 10 is determined by the student's ability to navigate their personal environment and utilize Self-Regulated Learning (SRL) skills, rather than the perceived excellence of the instructional tool provided.

CONCLUSIONS

Based on the findings of the study, it can be concluded that:

The Science 10 Self-Learning Modules are highly rated by students regarding Access and Content Clarity, validating the Department of Education's resource development and distribution efforts. The Science 10 Self-Learning Modules successfully ensured basic educational continuity, with the vast majority of students achieving at least a Very Satisfactory academic rating. Hence, there is no statistically significant relationship between the student's perceptions of Science 10 Self-Learning Modules utilization and their academic performance. Student success in the modular system is not determined by the perceives quality of the module itself, but is highly dependent on contextual, external factors related to learning environment and the student's capacity for self-regulation.

Based on the findings and conclusions, the following recommendations can be made. School administrators and the Department of Education should redirect resources from continuous module content revision to the development of robust home and learner support programs aimed at mitigating the highly varied challenges faced by the students. Second, teachers must integrate mandatory, explicit instruction on self-regulated learning (SRL) strategies across all grade levels to empower students to succeed independently regardless of their environment. Lastly, for the future researchers to conduct a follow-up mixed method study focusing on the students with discrepant results to qualitatively isolate and measure the specific motivational, socioeconomic, and environmental factors that mediate the relationship between the Science 10 Self-Learning Modules use and academic achievement.

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